

DURATION OF HUMAN SINGLETON PREGNANCIES IN IBADAN, NIGERIA

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Analysis of gestation length in an obstetric population of indigenous African women revealed a mean pregnancy duration of 274.8 days, which is similar to values recorded in women of African descent elsewhere, but about 1 week less than what generally has been reported in women of European ancestry and Japanese women. Factors associated with lower pregnancy duration among these women include increasing maternal age and gravidity, and the birth of a male infant. It is concluded that mean pregnancy duration in Nigerian women is shorter than the 280 days normally used in obstetric calculations. The consistent finding of a shorter length of gestation in these and other black women suggests earlier maturity of the fetoplacental unit. Earlier institution of antepartum fetal monitoring in women of African descent, particularly women >30 years old and those with high parity, may reduce the risks of fetal morbidity and mortality attributable to postmaturity in their offspring. (*J Natl Med Assoc.* 1997;89:617-621.)

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♦ Nigerian women

The duration of a pregnancy is a significant determinant of its outcome. Pregnancies that are considerably shorter or longer than the norm are more likely to be associated with perinatal morbidity and mortality.¹⁻³ Furthermore, important decisions about obstetric management such as induction of labor and the need for postpartum neonatal intensive care often depend on the gestational age of a patient at the time of birth relative to a calculated expected date of delivery.

The expected date of delivery traditionally has been estimated by adding 7 days and 9 months to the day of the last menstrual period, the so-called Naegele's rule. This is based on the assumption that the normal duration of human pregnancy is 280 days.⁴ However, several studies have shown consid-

erable variations in pregnancy duration between individuals and between groups of people.⁴⁻⁸ Among the factors that have been identified as affecting the duration of pregnancy are maternal age and parity,⁷ maternal diet,^{8,9} anthropometric characteristics,^{4,10} and ethnic origin.^{11,12}

It has been widely reported that the mean duration of pregnancy in women of African origin is consistently shorter than in women of European ancestry living in the same communities, with the differences ranging from 2.9 days¹³ to 9.6 days.¹⁴ The actual average duration of gestation recorded for black populations has varied from as low as 263.6 days to a high of 277 days.¹¹ Moreover, these studies were done in black populations that were not living in Africa.

It has been shown that migration of a group of women in Papua, New Guinea from their native habitat to a new location resulted in the lengthening of pregnancy duration.¹⁵ A previous study done in a group of women living in West Africa was restricted to only those with gestational ages between 34 and 42 weeks,¹⁶ limiting the conclusions that could be drawn from it.

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Table 1. Classification of Singleton Births at University College Hospital, Ibadan, Nigeria From 1986 to 1992

Time of Birth	No. (%) Births With "Confirmed Dates"	No. (%) Other Singleton Births	No. (%) All Singleton Births
Preterm	464 (11.0)	487 (10.3)	951 (10.6)
Term	3503 (83.3)	3665 (77.3)	7168 (80.1)
Postterm	239 (5.7)	590 (12.4)	829 (9.3)
Total	4206 (100)	4742 (100)	8948 (100)
Mean gestational age (days)	274.84	275.67	275.28
Standard deviation	16.09	24.07	19.78

Due to the influence exerted by the expected date of delivery on obstetric management, it is important to ascertain whether the duration of gestation in indigenous Africans is similar to what has been reported in black populations living outside Africa to determine the applicability of Naegele's rule to an indigenous African population and to study the factors affecting pregnancy duration among them. This study was undertaken to determine the mean duration of singleton pregnancies in an obstetric population of indigenous women in southwestern Nigeria and to study the effects of some obstetric characteristics such as maternal age and parity as well as fetal sex on pregnancy length.

MATERIALS AND METHODS

Patients who delivered babies at the University College Hospital, Ibadan, Nigeria, between January 1986 and December 1992 comprised the study population. Only those whose pregnancies extended beyond 28 completed weeks of pregnancy, whose onset of labor was spontaneous, and who had live singleton births were included. Pertinent information was retrieved from patients' obstetric records included the date of last menstrual period, gestational age and uterine size when patients were first seen at the antenatal clinic, ultrasonic assessment of gestational age, date and mode of delivery, and sex of the baby. The duration of gestation was defined as the period between the first day of the last menstrual bleeding and the date of birth of the infant. Term was defined according to World Health Organization criteria as being between 259 and 293 days of gestation.

Gestational ages were computed in days and then categorized into classes of completed weeks from the first day of the last menstrual period. The mean duration of gestation and standard deviation

were calculated for all patients. Patients also were divided into two groups: those who had clinical confirmation of their stated dates and those who did not. The criteria for inclusion in the "confirmed dates" group were:

- patient registered for antenatal care in the first or second trimester of pregnancy,
- uterine size at the time of registration for antenatal care agreed with the patients' stated dates, and
- ultrasonic assessment of biparietal diameter or fetal crown-rump length was compatible with the stated gestational age.

Those who met these criteria were divided into categories based on age, parity, and baby's sex, and the effects of these variables on the mean duration of gestation were determined. Statistical analysis to compare the categories were done using the *t* test for continuous variables and the chi-squared test for discrete variables. Limits of significance were set at the 5% level.

RESULTS

During the period covered by the study, there were 8948 singleton births recorded at the hospital, but only 4206 of these met the criteria for inclusion in the "confirmed dates" group. The major reasons for exclusion from the group were lack of ultrasonic assessment of gestational age before the third trimester of pregnancy (43%) or late registration for antenatal care (37%). About 80% of all the deliveries occurred at term. The distribution of preterm, term, and postterm deliveries is shown in Table 1. The most important difference is the relatively high proportion of postterm births among those whose dates could not be confirmed (12.4%) versus those with confirmed dates (5.7%). This difference was highly significant statistically ($\chi^2=89.9$; $P<.00001$). The mean duration of gestation in patients who met the

Table 2. Effects of Maternal Age, Parity, and Fetal Sex on the Duration of Singleton Pregnancies in Ibadan, Nigeria

	No. Births	Mean Duration of Gestation (Days)	Standard Deviation	Difference
Nullipara	1304	276.7	15.4	$t=4.53; P<.0001$
Multipara	2902	274.2	16.4	
Maternal age (years)				
<30	3029	275.4	14.7	$t=2.54; P<.05$
≥30	1177	273.9	17.2	
Baby's sex				
Male	2135	274.4	15.9	$t=2.26; P<0.05$
Female	2071	275.5	16.2	

inclusion criteria was 274.84 (standard deviation [SD] 16.09 days, which was lower than the 275.67 (SD 24.07) days in the excluded group. This did not reach statistical significance ($t=1.89; P>.05$) because wider dispersion in pregnancy duration in the latter group of patients.

Among patients in the confirmed dates group, the modal duration of pregnancy was 275 days and the median was 276 days. The distribution of pregnancy duration among this group of patients is shown in the Figure. With the onset of term, there was a sharp increase in the number of births; this tailed off rapidly after the 40th week of gestation.

Nulliparity was associated with a statistically significant increase in the duration of pregnancy (Table 2). Increasing maternal age seems to be associated with a shortening of gestation length with mothers <30 years old having a higher mean pregnancy duration than those aged ≥30. Although the difference between the mean pregnancy duration for male babies compared with females was <1 day, it was statistically significant (Table 2).

DISCUSSION

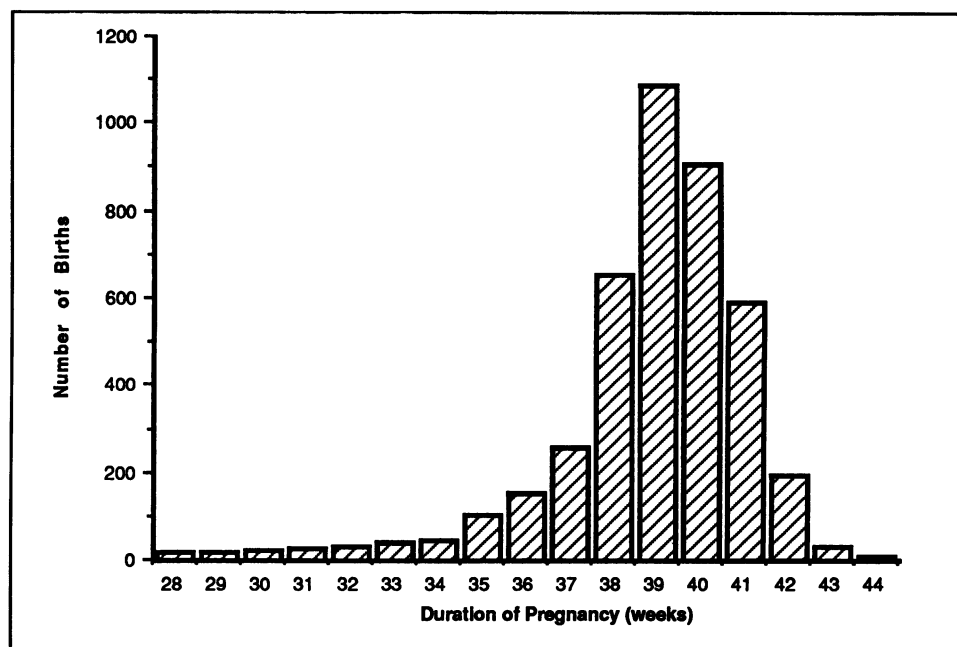
The mean pregnancy duration in these patients is comparable to the 273.8 days previously reported in a smaller study of women in eastern Nigeria.¹⁶ It is at the upper end of the spectrum of what has been reported in most studies done on expatriate black populations,^{5,11,12,17} and it is also higher than the mean pregnancy duration recorded in patient populations of South Asian origin.^{12,18} However, it is by about 1 week less than what generally has been reported in white populations^{7,10,11,19,20} and in studies of Japanese women.^{21,22} The reasons for these variations are unclear, but different criteria for patient inclusion in

these studies may play a role. It is important to note that in studies of multiracial obstetric populations in which the inclusion criteria were uniform, the mean pregnancy duration of black women was consistently lower than that of white women.¹¹ In this study, only pregnancies reaching ≥28 weeks were included, which may account in part for the mean pregnancy duration being near the upper end of the spectrum of values that have been recorded for people of African descent.

Accuracy of pregnancy dating is another factor that may affect the mean pregnancy duration in a given obstetric population. In many of the studies mentioned above, the stated dates of the patient was the sole parameter for assessing gestational age, which assumes accuracy of recall on the part of the patient. Such an assumption is not always valid as has been demonstrated repeatedly since the widespread availability of ultrasonic assessment of fetal gestational age.^{12,23} In this study, ultrasonic dating of pregnancies significantly reduced the proportion of patients classified as going past term which is in consonance with reports in other obstetric populations.^{23,24} Hence, exclusive reliance on the patient's recall of dates of last menstruation may lead to overestimation of the mean pregnancy duration in a given group of pregnant women.

Other factors that may explain the observed ethnic differences in mean pregnancy duration include maternal sociodemographic and anthropometric characteristics. Maternal height has been shown to be associated with a longer duration of pregnancy.⁴ However, maternal height is unlikely to be a contributory factor in the shorter gestation period seen in people of African descent because Afro-Caribbean women in Britain who have a higher

Figure.
Distribution of pregnancy duration in singleton births at University College Hospital, Ibadan, Nigeria.



mean height than their European counterparts nevertheless have a significantly shorter mean pregnancy duration.¹² Heavier women also are reported to have a longer mean pregnancy duration,¹⁰ yet African-American women, who tend to have a higher body mass index than their white counterparts,²⁵ have shorter mean pregnancy duration.^{5,14,20} This study has demonstrated that increases in maternal age and parity are associated with a lower mean pregnancy duration. There is a high general fertility rate in Nigeria, and women tend to bear children until they approach menopause.²⁶ These factors could be exerting a downward pressure on the mean pregnancy duration in Nigerian women.

Ethnic differences in the duration of pregnancy have important implications for obstetric care. While preterm births still pose the greatest challenge to perinatal health, postmaturity also can lead to significantly worse perinatal morbidity and mortality.³ Hence, pregnancies extending beyond the estimated date of delivery usually are subject to increased fetal surveillance. In most parts of sub-Saharan Africa, adequate and effective fetal monitoring is often impracticable, and the usual practice is to intervene once the pregnancy goes >14 days after the estimated date of delivery. If, as is widely assumed, the maturity of the fetoplacental unit plays a role in determining the time for the onset of labor,^{27,28} the placentae of African women at any given point at

term are probably more senescent than those of an obstetric population with a mean pregnancy duration that is ≥ 280 days. Indeed, studies have shown that at gestational ages <37 weeks, neonatal mortality rates among black infants are lower than in their white counterparts.^{5,20,29} Once pregnancies go beyond the 37th week, black neonatal mortality rates consistently exceed those of white babies.¹¹

These observations suggest that the onset of postmaturity may occur earlier in the pregnancies of women of African origin and fetal surveillance may need to be instituted at an earlier point during the pregnancy. Therefore, it is suggested that antepartum fetal surveillance for signs of postmaturity in women of African descent who have no other obstetric risk factors should be commenced at a gestational age of 39 weeks. Where such monitoring is not feasible, consideration should be given to routine intervention to deliver the baby when a gestational age of 41 weeks is reached. This approach to obstetric management may be of particular importance in older mothers and those of higher parity who have been shown in this study to have a lower mean pregnancy duration than young women of low gravidity.

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